If we similarly reduce the Greenwich position of 68 Virgini to Ptolemy's epoch, we find—

Longitude ... 178° 53′ Latitude ... $-3^{\circ}\ 14'$

and Baily's identification of the 19th of Virgo would thus appear the more satisfactory, at least if the reading he has adopted for the latitude is admitted; still there is the difficulty pointed out in his note which is given above; 68 Virginis is estimated a sixth magnitude both by Argelander and Heis.

In 1879 Mr. S. W. Burnham discovered that this star is a very close double, the mean of his measures giving—

1879·39 Position 81°·2. Distance 0″·47. Magnitude 6·1 and 6·6.

He remarks that hitherto close double-stars have not been found among the variables. It remains to be ascertained whether, if the variability of Schmidt's star be established, both or only one of the components vary.

A NEW COMET.—A telegram notifies the discovery of a comet by Mr. E. Barnard, on the 16th inst., though, probably from interruption from unfavourable weather in verifying it, the announcement appears not to have been made for several days subsequently. The position given is as follows:—

July 16 at $15^{h}\ 21^{m}\ 2^{s}$ G.M.T. ... R.A. $237^{\circ}\ 40'\ 0''$ ... N.P.D. $127^{\circ}\ 9'\ 52''$

It would be well within reach of the observatories of Southern Europe. From a telegram received at Dun Echt, Dr. Copeland conjectures that the comet has been seen at Melbourne, Madras, and Cape Town; Prof. Krüger has no allusion to this in his note in the *Astronomische Nachrichten.* The comet's motion is stated to be slow.

SCOTTISH METEOROLOGICAL SOCIETY

THE half-yearly general meeting of the Society was held on Monday, July 21, in Edinburgh, Mr. Milne Home in the chair.

Mr. Buchan read the report from the Council. As regards the Society's stations, one has been added since last general meeting at Glencarron, in Ross-shire. It has been established by Lord M'Laren, and from its position it is one of the most important additions recently made to the Society's stations. The effort made to increase the membership has been already attended with marked success. The membership now numbers 601. The first number of the new series of the Society's *Journal* is now mostly in type, and will shortly be in the members' hands. It has been arranged that in future the proceedings will appear annually in March. The Council referred with much satisfaction to the successful manner in which Mr. Omond and his assistants carry on the observations on Ben Nevis. The discussion of the past observations shows that paramount importance must be assigned to a continuous record, not only of the barometer, but also of the temperature, humidity, wind, cloud, and precipitation, on account of their intimate relations to the barometric fluctuations and to coming changes of weather. Every effort will therefore be made to secure to science a continuous hourly record of the weather phenomena of Ben Nevis. Arrangements have been made for the completion of the Observatory buildings during the course of this summer. A beginning of the work is made to-day (July 21), and it is expected that the whole will be finished some time before October. The new buildings include a tower, on the top of which will be placed anemometers, specially designed by Prof. Chrystal and Prof. Crum Brown, for registering the direction, velocity, and pressure of the wind, a correct knowledge of which is of supreme importance in carrying on the scientific and practical inquiries aimed at in the establishment of the Observatory. To the expenses connected with the erection of the anemometers a grant of 50*l.* has been made by the Committee of the Government Research Fund. An exit from the building has been made in the upper part of the tower, which will enable the observers to make outside observations during the winter months, on many occasions when they could not otherwise be attempted. The Council regret to intimate that their application to the Treasury for a grant in aid of the establishment of the Marine Station at Granton was not successful. Notwithstanding the refusal of the Government to give assistance, the Marine Station, to which the Society contributes 300*l.* a year from the Fishery Fund, was established in April. There is every probability that the subscriptions from the general public will shortly permit of very desirable extensions being made to the further equipment of the station. In response to an offer by the Scottish Sea-Fishing and Curing Company, Mr. Pearcey, of the *Challenger* Office, made observations on a cruise in the ship *Energy* in the North Sea, between Shetland and Norway. The specimens obtained during the cruise, and the observations made, are now under consideration.

A paper was read by Mr. Buchan on the meteorology of Ben Nevis, which we hope to give in an early number.

Dr. Arthur Mitchell described a new instrument for collecting continuously any cosmic dust, volcanic dust, or other impurities mechanically suspended in the atmosphere, the essential part of the instrument being a series of filters of fine platinum wires, through which the air is continuously drawn by an aspirator.

A report of the work done at the Scottish Marine Station at Granton was submitted by Mr. J. T. Cunningham, naturalist in charge. He detailed the nature of the work since the opening of the Station in April. The method of working in the yacht *Medusa* was then described. The position of the yacht is ascertained by means of bearings at the time when the dredge or other apparatus is put down or taken up. At these points the depth of the water and the nature of the bottom are ascertained, and various physical observations taken, including the temperature of the air, and that of the sea at the bottom, at the surface, and at intermediate depths; samples of sea water are also secured from different depths. When the dredge or trawl is hauled on deck, the contents are examined and the relative abundance of the animals and Algæ noted down. Some of the specimens are preserved on the spot, and a number of them are brought alive to the Station, and placed in the floating cages or in aquaria in the laboratory, so that they may be more minutely examined in the living state, and form a stock which may be drawn upon for purposes of special research. The products of the fine tow-nets are treated in the same way; a microscope is always on board, and in calm weather the minute specimens can be examined in the cabin. Samples of the contents of the tow-nets are preserved and labelled on board, and the remainder are brought back to the Station alive and examined in the laboratory. The results of one day's work at sea usually provide material for two or three days' work on shore. The work of dealing with the preserved collections, identifying and separating the animals, goes on continuously at the Station. The materials for faunological and systematic zoological work soon became abundant, and in the inquiries continuously carried on special attention is given to identify the numerous kinds of fish spawn, both floating and attached, which occur in the Firth of Forth and neighbouring parts of the sea. In order that the systematic and general work of the Station might not be neglected, the services of Mr. John Henderson as zoologist have been secured. The study of the Algæ has been energetically carried on by Mr. Rattray. The work carried on by Mr. Mill has been chiefly physical. A regular system of meterological observations, both on land and in the "ark," has been set on foot. Up to the present time three biologists have availed themselves of the opportunities afforded by the Station for research—Prof. W. A. Herdman, University College, Liverpool; Prof. Haycraft, Mason's College, Birmingham; and Mr. J. R. Davis, University College, Aberystwith.

Mr. Hugh Robert Mill read a paper on the tidal variation of temperature at the Marine Station. He detailed the nature of the experiments, these including hourly and half-hourly observations by night and by day on three occasions, extending in all to ninety-seven hours. The results show interesting relations between the temperature, the time of day, and the state of the tide. Without attempting to generalise, the following facts observed in each series of observations may be stated:—The surface temperature rose when the air temperature rose, and fell when it fell, with no very apparent reference to the tides. The curve for bottom temperature also followed that of air temperature, though to a slight extent; but the crest of the heat wave was retarded for several hours, and the tide produced great modifications in the temperature. When the tide flowed early in the morning it cooled the bottom temperature; when it entered at a later hour it raised it. By day the bottom temperature was lower than that of the surface; by night it was equal to it or slightly higher. The causes which produced these various effects must be very complex. The contour of the bottom of the quarry, the rates of influx of the tide, the direction of the currents it originates, the duration and period of the sunshine, the direction of the wind, the heating of the sand by the sun and its cooling by radiation, the heating and cooling of the surface water by radiation, and

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the bottom water by conduction and convection, must all be taken into account before a true explanation could be arrived at. It is intended to devote special attention to the effect of radiation on the sand, and of the heated or chilled sand on the tidal water which flows over it, it being probable that it is in this way the key to the curious tidal perturbations of temperature may be found.

THE PHILOSOPHICAL SOCIETY OF GLASGOW

THE *Proceedings* of the eighty-first session have just been published in the form of a volume of 428 pages, and consisting of twenty-four papers, three plates, and a map. The papers are: an address on some of the chemical industries of the country, by Mr. R. R. Tatlock, President of the Chemical Section; on technical education, by Mr. Henry Dyer, C.E.; a discussion of Mr. Dyer's paper, by Mr. E. M. Dixon, B.Sc.; an introductory address on the definition and scope of geography and ethnology, by Dr. W. G. Blackie, President of the Geographical and Ethnological Section; on the use of litmus, rosolic acid, methyl-orange, phenacetolen, and phenolphthaleïn as indicators, parts ii. and iii., by Mr. Robert T. Thomson; on an easy way of determining specific gravity of solids, by Dr. Dobbie and Mr. John B. Hutcheson; note on Mr. Joseph Whitley's centrifugal mode of casting steel plates for shipbuilding, &c., by Dr. Henry Muirhead, President; notes on Cleopatra's Needle, by the President, on the occasion of presenting a large bronze model of the Needle to the Society; on a new method of measuring the heat-conducting power of various materials, such as cotton, wool, hair, &c., by Mr. J. J. Coleman; on a new thermometer or thermoscope, by Mr. Coleman; on the measurement of electric currents and potentials, by Sir William Thomson; a sketch of the life and work of Dr. Allen Thomson, by Dr. McKendrick; note on modern forms of the microscope, by Dr. W. Limont; on the chief features of the physical geography of China, by Rev. A. Williamson, B.A., LL.D., Missionary in China; on the recent progress of chemistry at home and abroad, by Prof. J. J. Dobbie; on the analysis of commercial carbonate of potash, by Robert Thomson; on a new process for the separation of nickel and cobalt, by Dr. John Clark; on an endless solenoid galvanometer and voltmeter, by Prof. James Blyth; on the chemical composition of the methyl and ethyl alcohols, by Dr. Otto Richter; on the Island of New Guinea, by Dr. W. G. Blackie, illustrated by a map published by permission of the Royal Geographical Society; on the consumption of smoke, especially in great cities, by Mr. A. Pinkerton; on rickets in Glasgow and neighbourhood, and the relation of the disease to food and water used by the inhabitants, by Mr. James Thomson, F.G.S.; and the Graham Lecture by the late Dr. R. Angus Smith, prepared for publication by Mr. J. J. Coleman.

The last paper is probably the most interesting and important of all, inasmuch as it contains many unpublished letters of Thomas Graham, so full of information as to his work and the circumstances in which his work was done that it cannot fail to attract the notice of all engaged in physico-chemical research. The paper has a mournful interest also as being the last from the late Dr. R. Angus Smith. It will be published separately, in a small volume, for the use of those who desire to have a memorial of Thomas Graham.

The Society has a membership of 690. Its work is carried on not only by the parent Society, but by five sections—Chemistry, Biology, Architecture, Sanitary Science and Social Economy, and Geography and Ethnology.

SCIENCE IN RUSSIA

THE Kazan Society of Naturalists continues its useful work of exploration. The last volume of its *Memoirs* (*Trudy Obschestva Esteslvoispytateley pri Kazanskom Universitete*, vol. xii.) contains two papers by the late M. Shell, on the botanical geography of the provinces of Ufa and Orenburg, being a list of 1054 Spermatophores already known from these two regions which have an intermediate flora between that of South-Eastern Russia and that of the Caspian Steppes. A most useful addition to the knowledge of the flora of these provinces is contained in the second paper by the same author, which gives a list of no less than 511 species of Sporophores (28 Vascular plants, 49 Mosses, 2 Charæ, 181 Algæ, 94 Lichens, and 157 Fungi). The importance of this addition may be seen from the fact that, before M. Shell's work, only 39 species of Sporophores were known from these two provinces. It is worthy of notice that M. Shell has found among the Algæ the *Asterionella formosa*, Hassel, which has been discovered in England and was found on the Continent only by Brébisson in France, and by Heiberg in Denmark. The death of M. Shell in 1881 at Vilno was a great loss to Russian science. In the same volume M. Bekarevitch publishes his "Materials for the Flora of Kostroma," being a list of 514 species of Phanerogams and 18 Cryptogams. M. Flavitzky publishes his researches into the pitchers of different Conifers. The author has studied the deviations of their planes of polarisation, and has found that the value of the angle of deviation is quite characteristic for different pitchers; it varies from – 42°·2 (*Pinus abies*) to – 13°·1, – 10°·9, and – 9°·6 for the *Pinus sylvestris*, *P. cembra*, and *Abies sibirica*, and from + 9°·1 to + 27°·2 for the *Abies balsamea* and *Larix europæa*. We must notice also the elaborate researches, by A. Dogel, into the structure of the retina of the Ganoid fishes. These researches fill a gap which was pointed out many times; they are accompanied by excellent plates engraved at Leipzig.

The minutes of proceedings (*Protokoly*) of the same Society are especially interesting for mathematicians, as they contain a number of notes by MM. Maximowitch, Klark, and others. They are followed by papers on the motion of liquids in elastic tubes, by Prof. Gromeka; on the ichthyology of Kazan, by N. Varpakhovsky; and on the dangerous insects of Samara, by E. Peltzam.

The new volume of the *Memoirs* of the Kharkoff Society of Naturalists (*Trudy Obschestva Ispytateley Prirody pri Kharkovskom Universitete*, vol. xvii.) contains a paper by N. Koultchitzky, on the structure of the "Grandry corpuscles," being a description of that special form of corpuscle by which the nerve is terminated in the tongue of the duck, which M. Grandry distinguished in 1869 from the corpuscles of Herbst (or Pacini's with other animals). The paper is accompanied by three lithographed plates. M. Byeletzky's posthumous paper, on the physiology of the aërial or natatory bladder of fishes is a very elaborate memoir on this subject. The author, who has taken notice of nearly all the researches made in the same direction during more than a century, gives a detailed anatomical sketch of the bladder, and a summary of all known as to its contents. His own researches have been made on fifty-four individuals belonging to the following six species:—*Cyprinus carpio*, *Carassius vulgaris*, *Tinca vulgaris*, *Abramis brama*, *Idus melanotus*, and *Perca fluviatilis*. The gases contained in the bladder are: nitrogen, from 81 to 96 per cent. of the whole (sometimes even 98); oxygen, mostly less than 10 per cent., and very seldom from 15 to 20 per cent.; and carbonic acid from 2 to 5 per cent., falling to 0·6, and very seldom reaching more than 7 per cent. The contents of carbonic acid depends very much upon the conditions which the fish has been kept in before the experiments; but it stands in no correlation at all with the contents of oxygen. The amount of both may be simultaneously small, or greatly above the average. As to the origin of the gases in the bladder, the author indorses the views of Configliachi (Schweigger's *Journal für Chemie und Physik*, Band i. 1811), and concludes that they are not indebted for their origin either to digestion or to the supposed "swallowing" of air on the surface of the water; individuals kept for months under water, without having the possibility of reaching its surface, having been found to have the same composition of gases in the bladder as free individuals. It would rather seem that, with the raising of the fish on the surface, which is accompanied by a diminution of atmospheric pressure, a part of the gas is expelled from the bladder. The most probable origin of the gases in the bladder seems to be —Configliachi said—that the air contained in the water and entering into the mouth of the fish is in some way (perhaps in that pointed out by Erman) eliminated from it; it is dissolved in the blood of the gills, and the oxygen is slowly assimilated by the blood; while the remainder, that is, nitrogen and some oxygen which has remained dissolved, are secreted from the blood into the bladder. This is also the opinion of M. Byeletzky, who considers that blood, as also the lymph, is the source whence the gases of the bladder originate. Contrary to Configliachi's opinion, they are not secreted, however, by the "red corpuscles," but rather by the capillary vessels of the mucous membrane of the bladder; such was also the opinion of Rathke and Johann Müller; however, the argument by which they tried to establish this view cannot be longer held. In

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